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Elridge A. Stafford
Executive Director-
Federal Regulatory

April 26, 1994

NOTICE OF EX PARTE

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Mail Stop 1170
Washington, D.C. 20554

RE: Gen. Docket No. 90-314

Dear Mr. Caton:

Representatives of U S WEST met today with Rodney Small and Thomas Derenge of the Office of Engineering and Technology, and Greg Rosston and John Williams of the Office of Plans and Policy to discuss issues raised by U S WEST on reconsideration of the Second Report and Order in the above mentioned proceeding. U S WEST was represented by Sue Mason, Director-Public Policy, U S WEST Personal Communications Development Group, Dave Jones, Manager-Radio System Analysis and Planning, U S WEST Personal Communications Development Group, and Elridge Stafford, Executive Director - Federal Regulatory. Attached are handouts used in this meeting.

In accordance with Section 1.1206(a)(2) of the Commission's rules, the original and one copy of this letter, with attachments, are being filed with your office. Acknowledgment and date of receipt of these transmittals are requested. A duplicate of this letter is included for this purpose.

Please contact me at (202) 429-3134 should you have any questions concerning this matter.

Sincerely,

Elridge Stafford

USWEST

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

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Attachment

**cc: Mr. Rodney Small
Mr. Thomas Derenge
Mr. John Williams
Mr. Greg Rosston**

PCS Base Station Power Limits

**presented to the
Federal Communications Commission**

by

U S WEST, Inc.

April 26, 1994

**FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY**

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U S WEST's Position on PCS Power Limits

- **Base station maximum EIRP should be increased from 100 to 1600 Watts**
- **Subscriber unit power limits need not be changed (portable vs. mobile)**
- **OFS microwave coordination, license area boundary and rf exposure limits still apply**

Why More Power?

A higher power limit is necessary to enable PCS licensees to:

- **Compete with cellular and SMR carriers in terms of price and service**
- **Economically meet the FCC's buildout requirements (even at 75%)**
- **Take advantage of new and emerging technologies (e.g., "Smart Antennas")**

PCS Must Be Competitive with Cellular/SMR

- **“Propagation penalty” between 850 MHz and 1900 MHz is 8 to 12 dB**
- **Three to four times as many cells would be required to cover suburban and rural areas if the power limits were the same (500 Watts ERP -- 820 Watts EIRP)**
- **With a 100 Watt limit for PCS a 17 to 21 dB penalty results, and seven times as many cells are required**
- **This penalty is in addition to the costs of spectrum and microwave relocation**

Primary use would be in low traffic density areas (suburban, rural, highway), which typically comprise about 80% of the cells in an MTA

Why 1600 Watts EIRP?

- **To achieve “coverage parity” with cellular, 8200 Watts would be necessary (assuming 10 dB additional free-space loss)**
- **Contending PCS systems (e.g., CDMA and DCS1800) are proposing 25 Watt power amplifiers which, when coupled with an 18 dBi sectored antenna generate 1577 Watts**
- **A “Smart Antenna” system (with 25 dBi gain), when coupled with a 5 Watt power amplifier, would radiate 1580 Watts EIRP**
- **Motorola, PCIA (Telocator) and others support 1000 Watts ERP (=1600 Watts EIRP)**

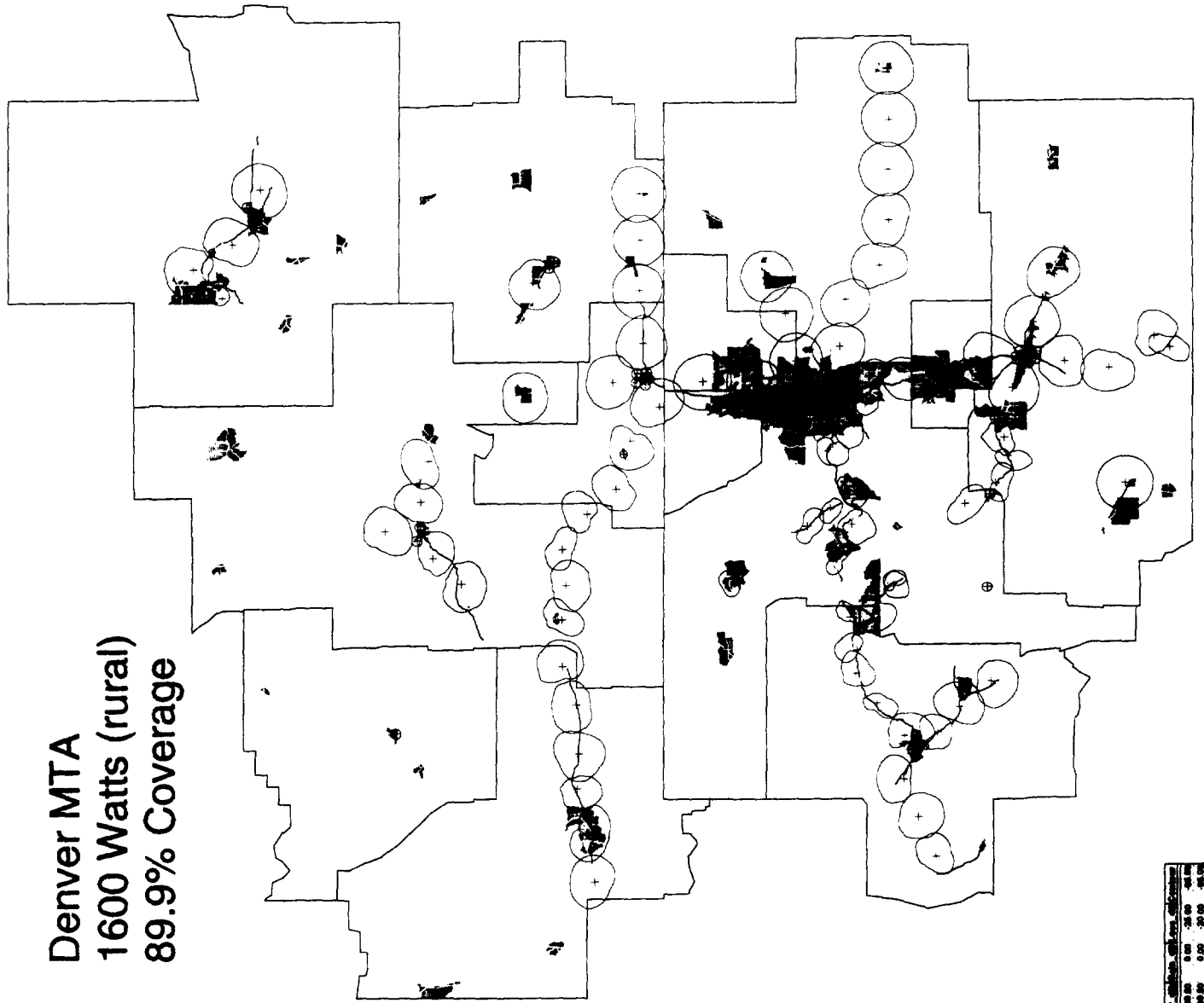
Issues Associated with Higher Power Limits

- **ANSI/IEEE (C95.1-1992) RF exposure limits still apply, and will not be compromised by higher power limits**
- **OFS microwave coordination requirements still apply (during the transition period)**
- **Downlink/uplink balance should be preserved**
 - **Typical difference is 10 dB (for portables; 3 dB for mobiles), and is required to facilitate paging and “keep alive” functions**
 - **No reason to increase this margin for PCS, but it should not be reduced**
 - **This can be ensured by coupling BS power limits with minimum antenna gain or maximum antenna input power**
- **Total site power is much less for digital (TDMA, CDMA) technologies than with analog cellular (AMPS) because a single carrier serves several users (8 to 20)**

Impact of BS Power Limit and Buildout Requirements on Network Cost

BTA Market	Area (sq. mi.)			Cost (\$M @ 100W)			Cost (\$M @ 1600W)		
	<u>67%</u>	<u>75%</u>	<u>90%</u>	<u>67%</u>	<u>75%</u>	<u>90%</u>	<u>67%</u>	<u>75%</u>	<u>90%</u>
Boise	1,645	2,615	18,649	46.2	68.2	117.8	20.0	23.5	36.2
Albq.	1,062	2,234	15,202	29.7	56.4	96.5	12.8	16.8	26.8
Spokane	5,848	7,093	13,485	279.4	307.7	327.6	84.4	88.8	94.0
Santa Fe	2,018	4,221	10,079	111.0	161.0	179.2	24.7	32.1	36.9
MTA Market									
				<u>75%</u>	<u>88.6%</u>		<u>79%</u>	<u>89.9%</u>	
Denver				39.1	118.1		46.6	82.0	

Denver MTA 1600 Watts (rural) 89.9% Coverage



Daily Vehicle Traffic Counts
 Greater Than 100,000
 Greater Than 50,000
 Greater Than 25,000
 Greater Than 10,000
 Greater Than 5,000
 Greater Than 1,000
 Greater Than 500
 Greater Than 100
 Greater Than 50
 Greater Than 10
 Greater Than 5
 Greater Than 1

Year	1990	1980	1970	1960	1950	1940	1930	1920	1910	1900	1890	1880	1870	1860	1850	1840	1830	1820	1810	1800	1790	1780	1770	1760	1750	1740	1730	1720	1710	1700	1690	1680	1670	1660	1650	1640	1630	1620	1610	1600	1590	1580	1570	1560	1550	1540	1530	1520	1510	1500	1490	1480	1470	1460	1450	1440	1430	1420	1410	1400	1390	1380	1370	1360	1350	1340	1330	1320	1310	1300	1290	1280	1270	1260	1250	1240	1230	1220	1210	1200	1190	1180	1170	1160	1150	1140	1130	1120	1110	1100	1090	1080	1070	1060	1050	1040	1030	1020	1010	1000	990	980	970	960	950	940	930	920	910	900	890	880	870	860	850	840	830	820	810	800	790	780	770	760	750	740	730	720	710	700	690	680	670	660	650	640	630	620	610	600	590	580	570	560	550	540	530	520	510	500	490	480	470	460	450	440	430	420	410	400	390	380	370	360	350	340	330	320	310	300	290	280	270	260	250	240	230	220	210	200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100	-110	-120	-130	-140	-150	-160	-170	-180	-190	-200	-210	-220	-230	-240	-250	-260	-270	-280	-290	-300	-310	-320	-330	-340	-350	-360	-370	-380	-390	-400	-410	-420	-430	-440	-450	-460	-470	-480	-490	-500	-510	-520	-530	-540	-550	-560	-570	-580	-590	-600	-610	-620	-630	-640	-650	-660	-670	-680	-690	-700	-710	-720	-730	-740	-750	-760	-770	-780	-790	-800	-810	-820	-830	-840	-850	-860	-870	-880	-890	-900	-910	-920	-930	-940	-950	-960	-970	-980	-990	-1000	-1010	-1020	-1030	-1040	-1050	-1060	-1070	-1080	-1090	-1100	-1110	-1120	-1130	-1140	-1150	-1160	-1170	-1180	-1190	-1200	-1210	-1220	-1230	-1240	-1250	-1260	-1270	-1280	-1290	-1300	-1310	-1320	-1330	-1340	-1350	-1360	-1370	-1380	-1390	-1400	-1410	-1420	-1430	-1440	-1450	-1460	-1470	-1480	-1490	-1500	-1510	-1520	-1530	-1540	-1550	-1560	-1570	-1580	-1590	-1600	-1610	-1620	-1630	-1640	-1650	-1660	-1670	-1680	-1690	-1700	-1710	-1720	-1730	-1740	-1750	-1760	-1770	-1780	-1790	-1800	-1810	-1820	-1830	-1840	-1850	-1860	-1870	-1880	-1890	-1900	-1910	-1920	-1930	-1940	-1950	-1960	-1970	-1980	-1990	-2000	-2010	-2020	-2030	-2040	-2050	-2060	-2070	-2080	-2090	-2100	-2110	-2120	-2130	-2140	-2150	-2160	-2170	-2180	-2190	-2200	-2210	-2220	-2230	-2240	-2250	-2260	-2270	-2280	-2290	-2300	-2310	-2320	-2330	-2340	-2350	-2360	-2370	-2380	-2390	-2400	-2410	-2420	-2430	-2440	-2450	-2460	-2470	-2480	-2490	-2500	-2510	-2520	-2530	-2540	-2550	-2560	-2570	-2580	-2590	-2600	-2610	-2620	-2630	-2640	-2650	-2660	-2670	-2680	-2690	-2700	-2710	-2720	-2730	-2740	-2750	-2760	-2770	-2780	-2790	-2800	-2810	-2820	-2830	-2840	-2850	-2860	-2870	-2880	-2890	-2900	-2910	-2920	-2930	-2940	-2950	-2960	-2970	-2980	-2990	-3000	-3010	-3020	-3030	-3040	-3050	-3060	-3070	-3080	-3090	-3100	-3110	-3120	-3130	-3140	-3150	-3160	-3170	-3180	-3190	-3200	-3210	-3220	-3230	-3240	-3250	-3260	-3270	-3280	-3290	-3300	-3310	-3320	-3330	-3340	-3350	-3360	-3370	-3380	-3390	-3400	-3410	-3420	-3430	-3440	-3450	-3460	-3470	-3480	-3490	-3500	-3510	-3520	-3530	-3540	-3550	-3560	-3570	-3580	-3590	-3600	-3610	-3620	-3630	-3640	-3650	-3660	-3670	-3680	-3690	-3700	-3710	-3720	-3730	-3740	-3750	-3760	-3770	-3780	-3790	-3800	-3810	-3820	-3830	-3840	-3850	-3860	-3870	-3880	-3890	-3900	-3910	-3920	-3930	-3940	-3950	-3960	-3970	-3980	-3990	-4000	-4010	-4020	-4030	-4040	-4050	-4060	-4070	-4080	-4090	-4100	-4110	-4120	-4130	-4140	-4150	-4160	-4170	-4180	-4190	-4200	-4210	-4220	-4230	-4240	-4250	-4260	-4270	-4280	-4290	-4300	-4310	-4320	-4330	-4340	-4350	-4360	-4370	-4380	-4390	-4400	-4410	-4420	-4430	-4440	-4450	-4460	-4470	-4480	-4490	-4500	-4510	-4520	-4530	-4540	-4550	-4560	-4570	-4580	-4590	-4600	-4610	-4620	-4630	-4640	-4650	-4660	-4670	-4680	-4690	-4700	-4710	-4720	-4730	-4740	-4750	-4760	-4770	-4780	-4790	-4800	-4810	-4820	-4830	-4840	-4850	-4860	-4870	-4880	-4890	-4900	-4910	-4920	-4930	-4940	-4950	-4960	-4970	-4980	-4990	-5000	-5010	-5020	-5030	-5040	-5050	-5060	-5070	-5080	-5090	-5100	-5110	-5120	-5130	-5140	-5150	-5160	-5170	-5180	-5190	-5200	-5210	-5220	-5230	-5240	-5250	-5260	-5270	-5280	-5290	-5300	-5310	-5320	-5330	-5340	-5350	-5360	-5370	-5380	-5390	-5400	-5410	-5420	-5430	-5440	-5450	-5460	-5470	-5480	-5490	-5500	-5510	-5520	-5530	-5540	-5550	-5560	-5570	-5580	-5590	-5600	-5610	-5620	-5630	-5640	-5650	-5660	-5670	-5680	-5690	-5700	-5710	-5720	-5730	-5740	-5750	-5760	-5770	-5780	-5790	-5800	-5810	-5820	-5830	-5840	-5850	-5860	-5870	-5880	-5890	-5900	-5910	-5920	-5930	-5940	-5950	-5960	-5970	-5980	-5990	-6000	-6010	-6020	-6030	-6040	-6050	-6060	-6070	-6080	-6090	-6100	-6110	-6120	-6130	-6140	-6150	-6160	-6170	-6180	-6190	-6200	-6210	-6220	-6230	-6240	-6250	-6260	-6270	-6280	-6290	-6300	-6310	-6320	-6330	-6340	-6350	-6360	-6370	-6380	-6390	-6400	-6410	-6420	-6430	-6440	-6450	-6460	-6470	-6480	-6490	-6500	-6510	-6520	-6530	-6540	-6550	-6560	-6570	-6580	-6590	-6600	-6610	-6620	-6630	-6640	-6650	-6660	-6670	-6680	-6690	-6700	-6710	-6720	-6730	-6740	-6750	-6760	-6770	-6780	-6790	-6800	-6810	-6820	-6830	-6840	-6850	-6860	-6870	-6880	-6890	-6900	-6910	-6920	-6930	-6940	-6950	-6960	-6970	-6980	-6990	-7000	-7010	-7020	-7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